emPOWER everyone

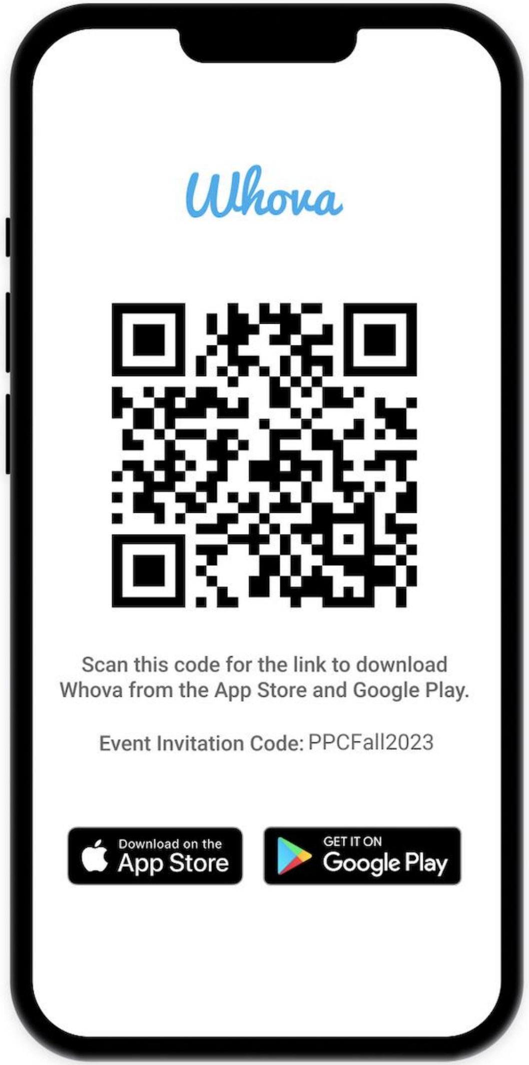
Microsoft Power Platform
CONFERENCE

POWER BI | POWER AUTOMATE | POWER APPS | POWER VIRTUAL AGENTS | POWER PAGES

Unlock the Hidden Potential of Virtual Tables

Nathalie Leenders

The official event app for the **Microsoft Power Platform Conference – Fall 2023**



Whova

Scan this code for the link to download Whova from the App Store and Google Play.

Event Invitation Code: PPCFall2023

Download on the App Store
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Join the event app to access:

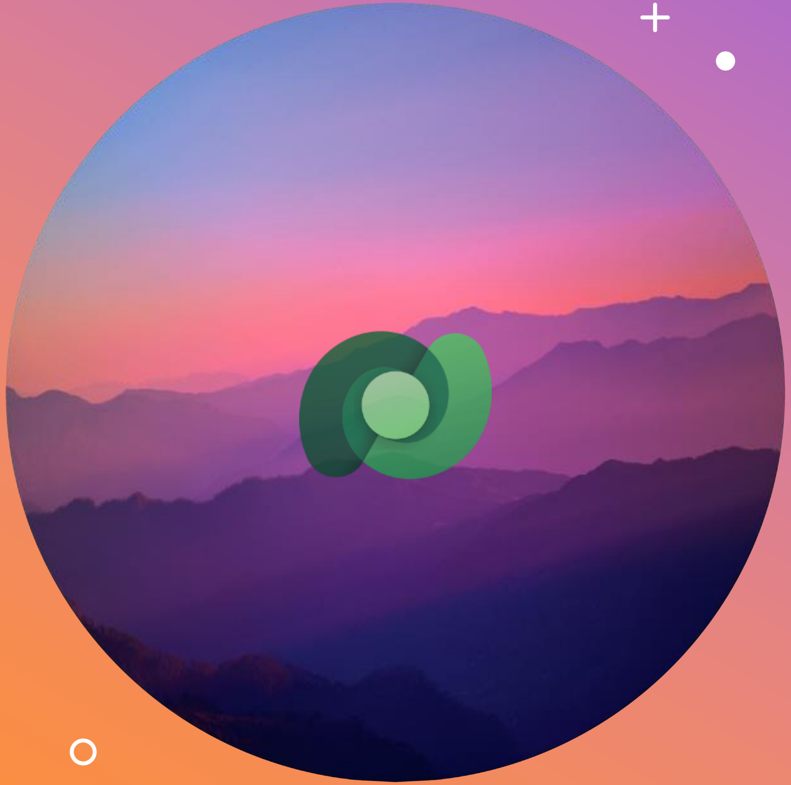
- Event announcements
- Personalized agenda, session details
- Speaker & attendee profiles
- Networking, meet-ups, messages
- Event documents

Event Invitation Code:
PPCFall2023

MVP Microsoft® Most Valuable Professional

Who am I?

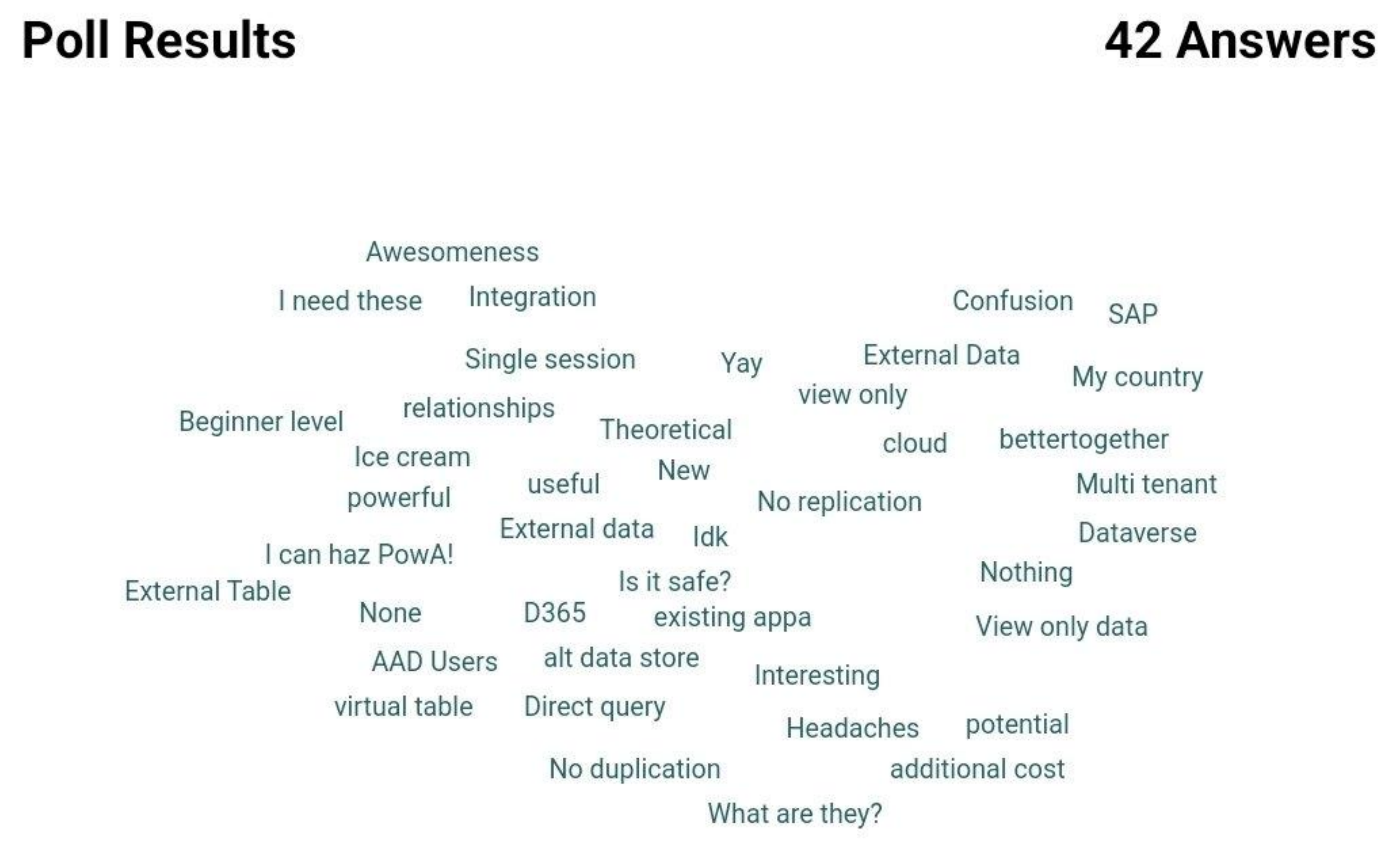
- Senior Power Platform Developer
- Former hairdresser turned IT
- Microsoft MVP Business Applications
- ITIL V3 + 9x Microsoft certified
- Has a purrrsonal assistant called Floof
- Married, got a bonus daughter
- Loves to travel and share knowledge
- Expect memes and Muppets



AGENDA

Storytime
What are Virtual Tables?
Functionality
Different Native Data sources
Leveraging the Power Platform
Reporting
Known Limitations
Technical Deep Dive
How to connect to the 1000+ connectors?
Questions

VIRTUAL TABLE WORD BUBBLE



Poll Results

42 Answers

Awesomeness
I need these
Integration
Confusion
SAP
Single session
Yay
External Data
My country
view only
Beginner level
relationships
Theoretical
cloud
bettertogether
Ice cream
useful
New
Multi tenant
powerful
No replication
External data
Idk
Dataverse
I can haz PowA!
Nothing
External Table
Is it safe?
None
D365
existing appa
View only data
AAD Users
alt data store
Interesting
virtual table
Direct query
Headaches
potential
No duplication
additional cost
What are they?

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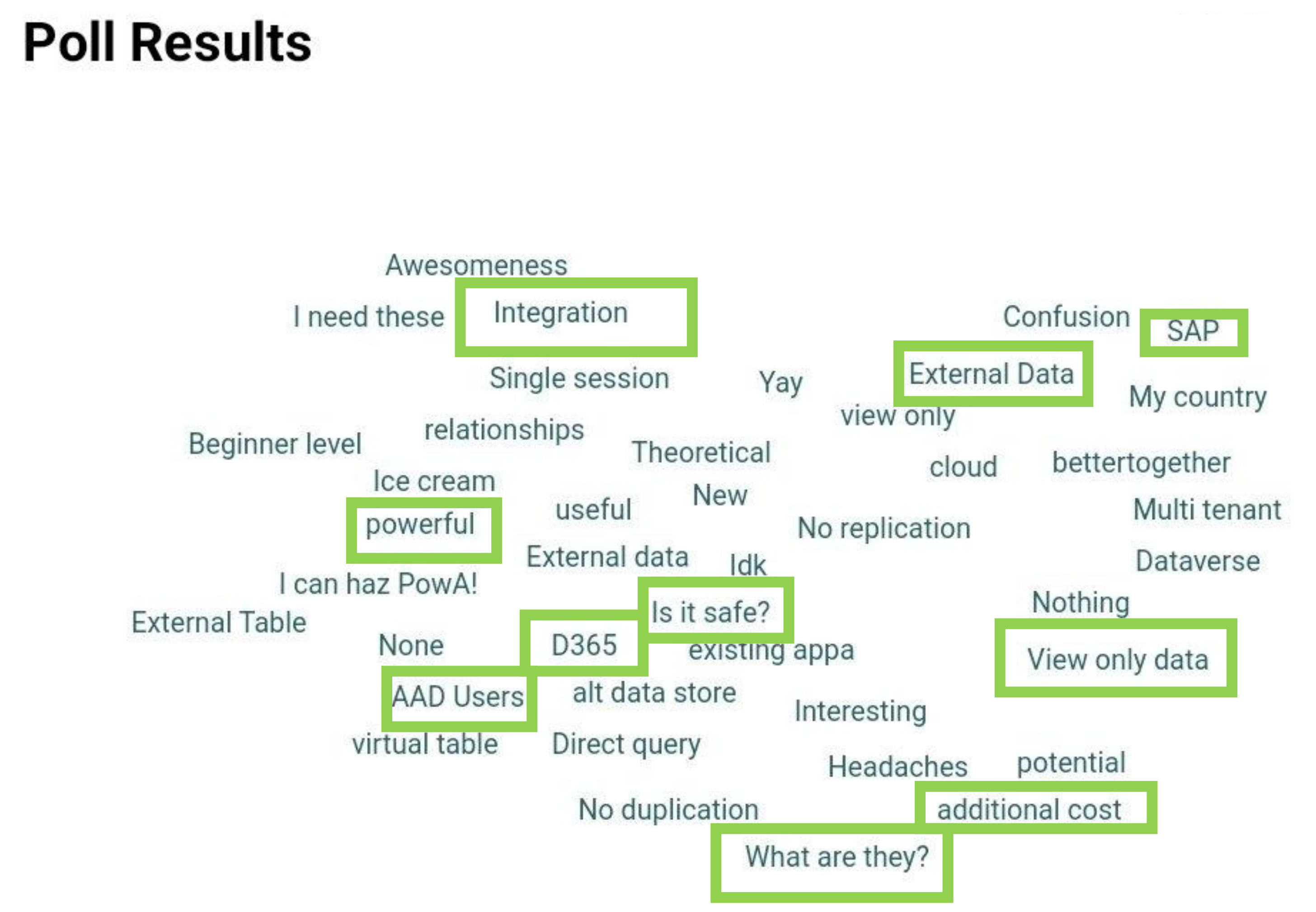

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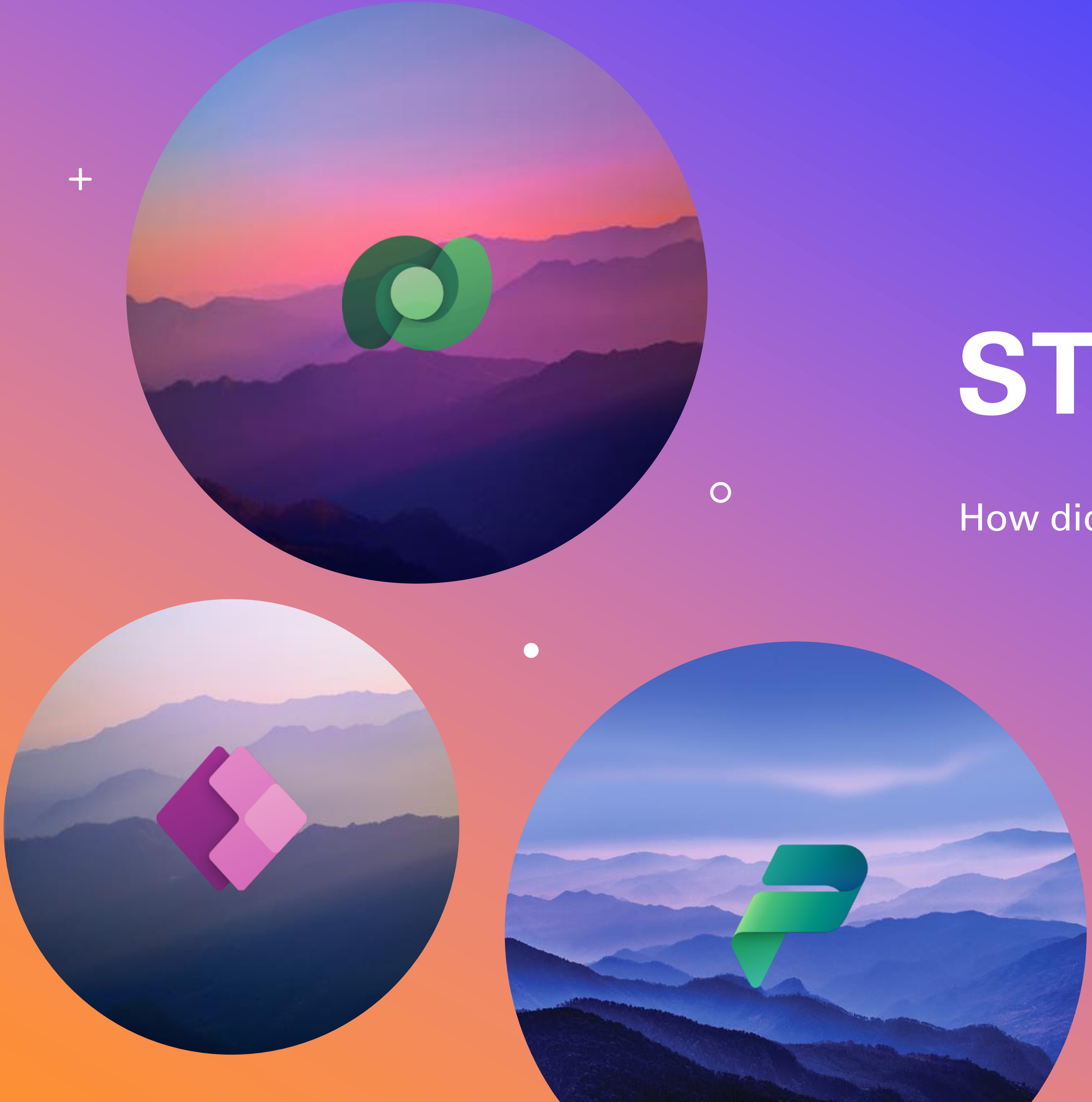
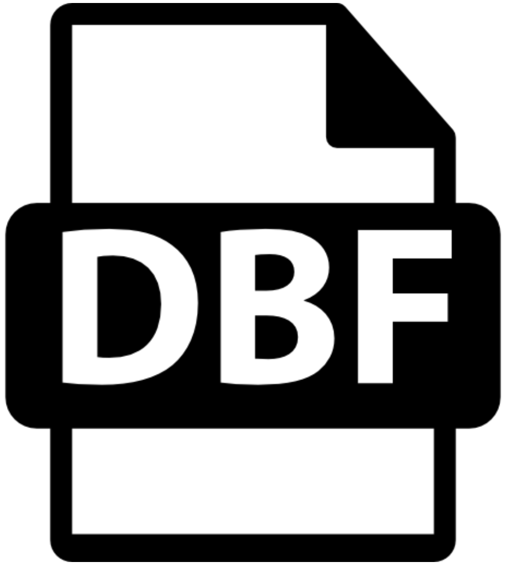
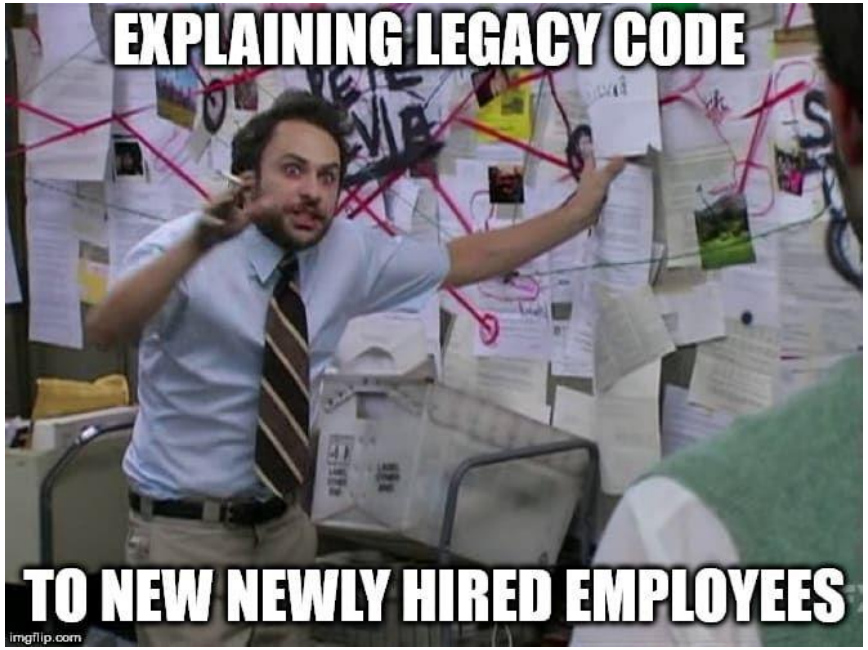


STORYTIME

How did I end up with Virtual tables?

Replacing a legacy app – The data

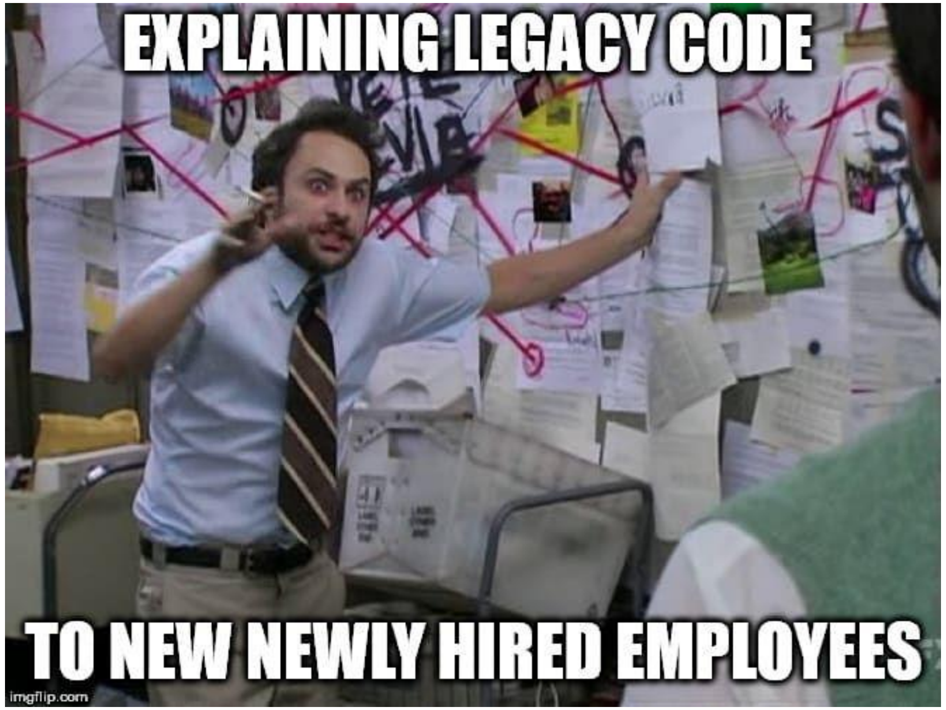



EXPLAINING LEGACY CODE
TO NEW NEWLY HIRED EMPLOYEES
imgflip.com

The application we wanted to replace, had a DBF data backend

250+ tables, no known schema or relationships, no documentation

Replacing a legacy app – The export


EXPLAINING LEGACY CODE
TO NEW NEWLY HIRED EMPLOYEES
imgflip.com

Only software to read the data I could get, was the DBF View with export to csv option
Manually exported, hand picked over 50 tables to CSV (it was either that or learn Python)

Replacing a legacy app – The solution

SQL Database
Pipeline loaded in all the data into tables

+

Dataverse
Connected to SQL using Virtual Tables

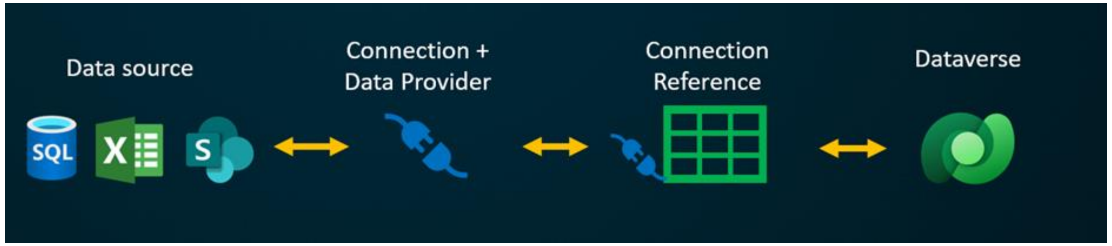
=

PowerApps
Connected with Virtual Tables

WHAT ARE VIRTUAL TABLES?

And why should I use them?

What are they?


Data source
SQL
Connection +
Data Provider
Connection
Reference
Dataverse

- Your Virtual Table reads your data from your data source and is able to display it in Dataverse.
- Virtual connectors and tables in Dataverse
- **Re-use data**, without needing to migrate
  - Use them through Dataverse in your app, Power Pages or others.
- Through this connection you can automate without excessive costs for migrations.
- **Full CRUD** (Create, Read, Update, Delete) to your data source.

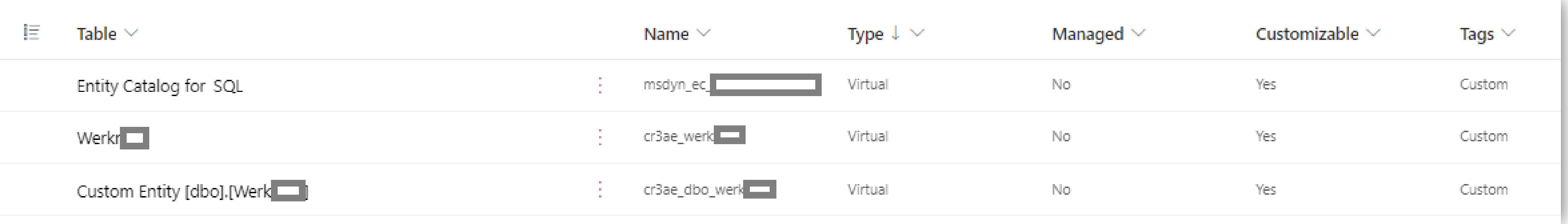


Table	Name	Type ↓	Managed	Customizable	Tags
Entity Catalog for SQL	msdyn_ec[redacted]	Virtual	No	Yes	Custom
Werk[redacted]	cr3ae_werk[redacted]	Virtual	No	Yes	Custom
Custom Entity [dbo].[Werk[redacted]]	cr3ae_dbo_werk[redacted]	Virtual	No	Yes	Custom

Considerations

Architecture

Model driven apps and **Power Pages** can only use Dataverse as a data source.

Can we add new components to the apps that are compatible?

Auditing

Auditing can only take place on the source, **not** on the Virtual Table itself, does this fit the requirements?

Data Migration

Does the client have budget and desire to move the data?

You can **reuse** data.

Prevent high costs.

Premium license needed.

Functionality

Does the solution fit within the constraints of Virtual Tables?

Is your source SQL and do you want dropdown menus?

Timeline

1996	ZappySys Driver First Virtual Tables?
1997	Microsoft Jet 3.5
1998	4d web component
2004	NAVision – Virtual tables – links to tables on SQL
Pre-2021	**No Virtual Data connector Provider** – Requires Code
Oct ’21 May ’22	**Virtual Connector Provider** – register with Azure – No code required
Mid-2022	Full CRUD Supports relationships
Jan 2023	**Virtual Connector Provider- NEW wizard** No Code Customize names Quick setup
2023 - March	Dataverse for Teams support Polymorphic relationships added
Future	?

Timeline

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Future	?	

ALM for Virtual Tables (Private Preview in October!)

EXCLUSIVE

MAKE USE OF **ENVIRONMENT VARIABLES** UPON CREATION

PROVIDE BETTER **PIPELINE DISTRIBUTION**

NO MORE MANUAL WORK AFTERWARDS!

SQL AND **SHAREPOINT** VIRTUAL TABLES CAN USE **ENVIRONMENT VARIABLES**

EXPORT
IN THE SOLUTION MAKER YOU CAN SELECT/CREATE A TARGET SOURCE

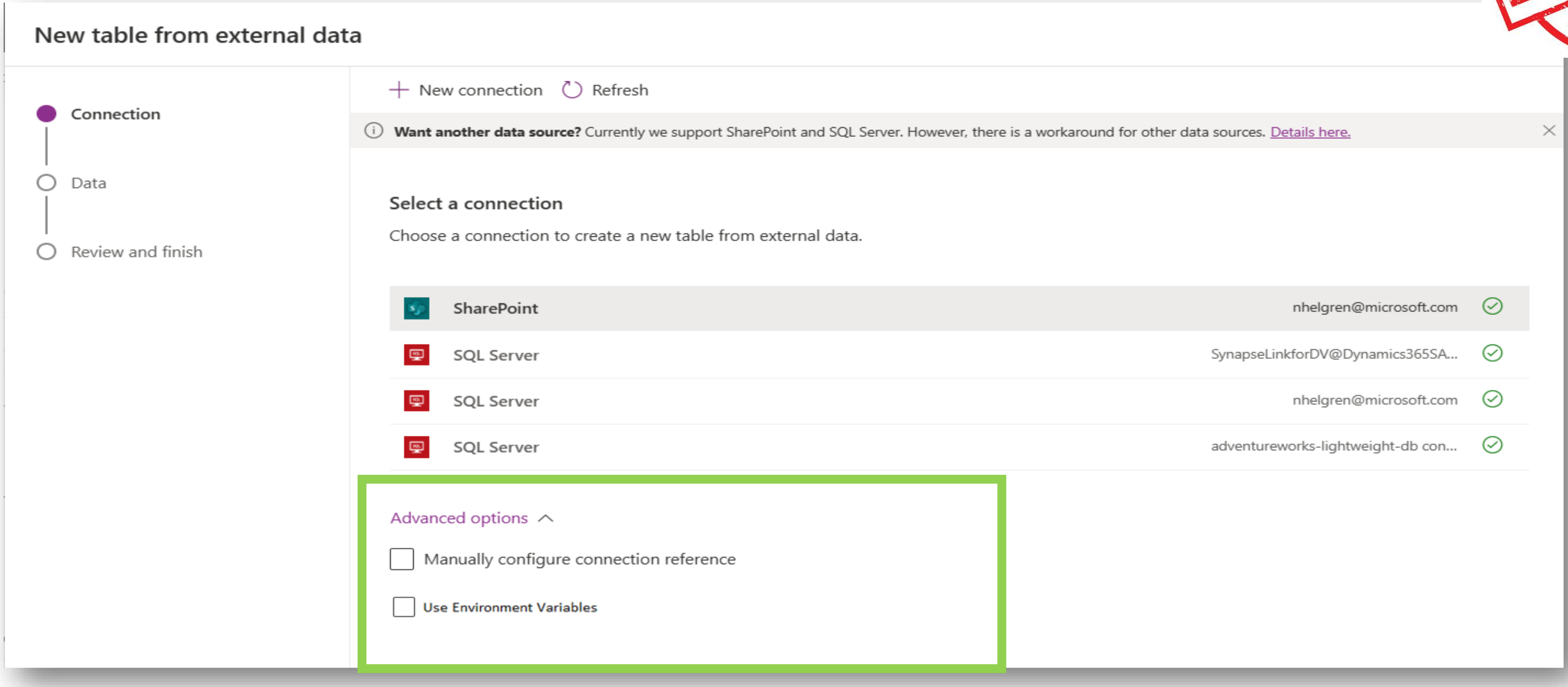
IMPORT
USERS CAN SELECT/PROVIDE THE TARGET SOURCE

TO BE ADDED **DIRECTLY IN THE ALM PIPELINE.**

Future

ALM for Virtual Tables (Private Preview in October!)

EXCLUSIVE



New table from external data

- ● Connection
- ○ Data
- ○ Review and finish

+ New connection ⟳ Refresh

ⓘ **Want another data source?** Currently we support SharePoint and SQL Server. However, there is a workaround for other data sources. Details here.

Select a connection

Choose a connection to create a new table from external data.

SharePoint	nhelgren@microsoft.com	✓
SQL Server	SynapseLinkforDV@Dynamics365SA...	✓
SQL Server	nhelgren@microsoft.com	✓
SQL Server	adventureworks-lightweight-db con...	✓

Advanced options ^

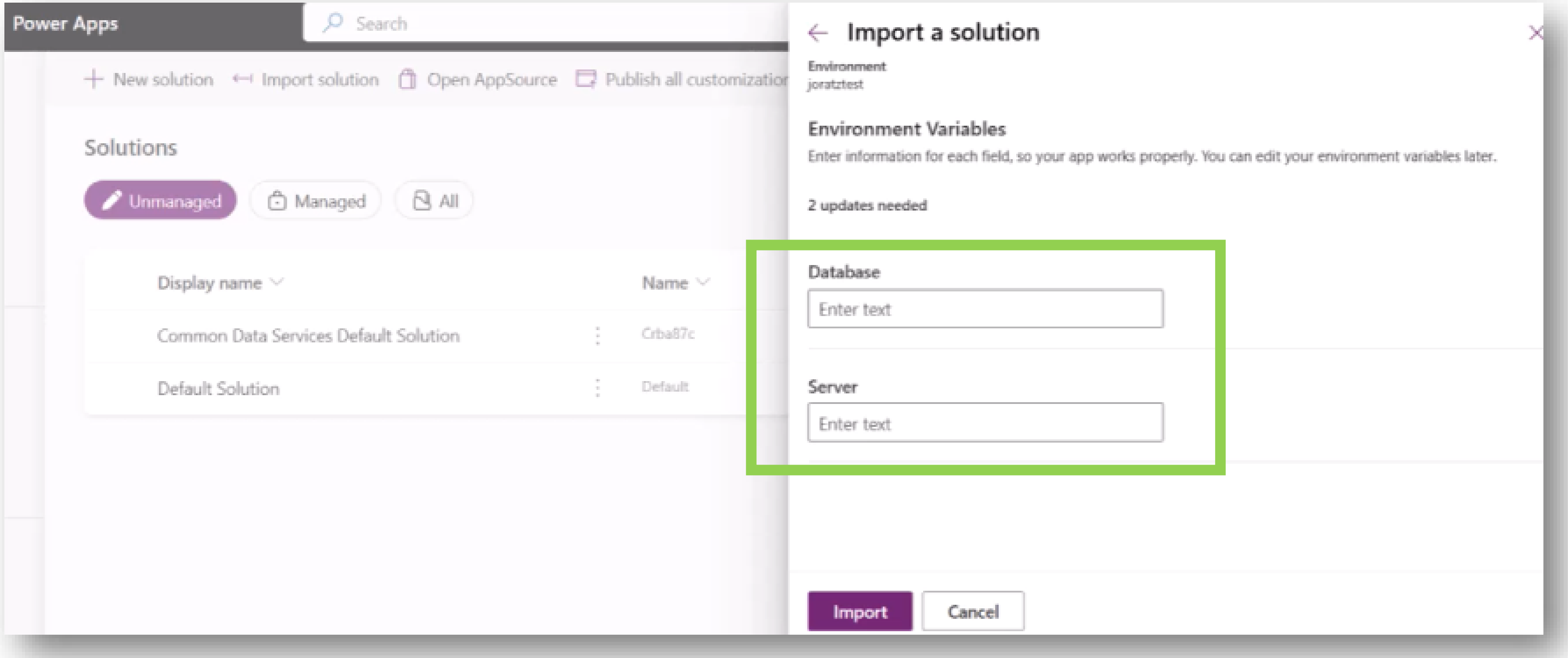
☐ Manually configure connection reference

☐ Use Environment Variables

Future

ALM for Virtual Tables (Private Preview in October!)

EXCLUSIVE


Power Apps
Search
New solution
Import solution
Open AppSource
Publish all customizations
Solutions
Unmanaged
Managed
All
Display name
Name
Common Data Services Default Solution
Crba87c
Default Solution
Default
Import
Cancel

Import a solution

Environment
joratztest

Environment Variables

Enter information for each field, so your app works properly. You can edit your environment variables later.

2 updates needed

Database: Enter text

Server: Enter text

Future

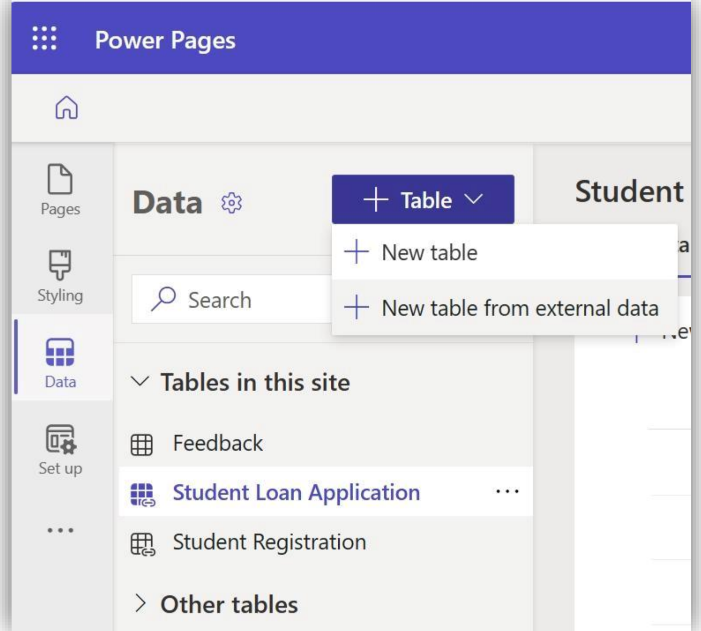
EXCLUSIVE

Virtual Tables on Model Driven apps & Power Pages!

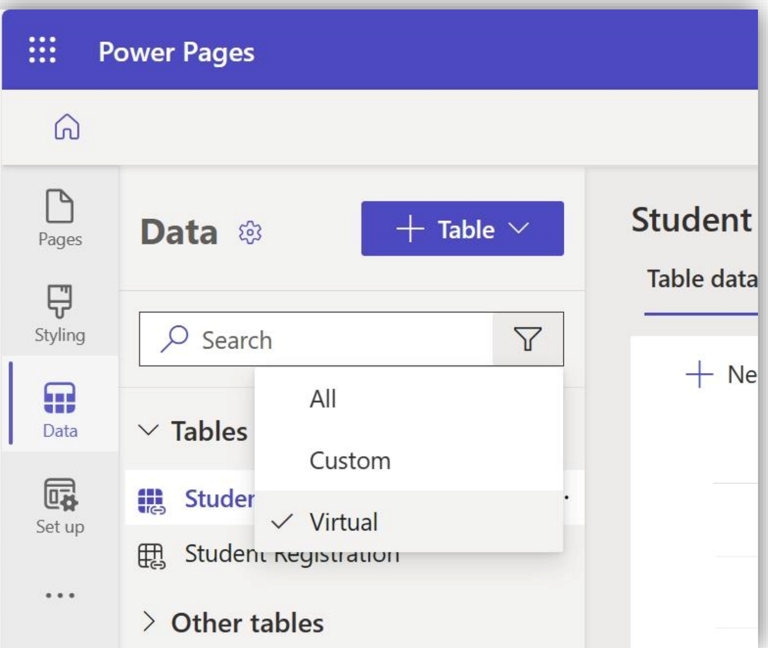
Currently you can add an existing virtual table to Power Pages, however….

New announcements! Hot of the presses!

- **Create** a Virtual Table straight from Power Pages with SQL and Sharepoint (lists)!
  - You can do this through the newly added - connect to an external table data option.
- **Filter** on virtual or regular on the add table interface
- The **icon** has also changed to differentiate between the types of tables, Virtual vs Dataverse



Power Pages
Pages
Styling
Data
Set up
...
Data
+ Table
New table
New table from external data
Search
Student
Tables in this site
Feedback
Student Loan Application
Student Registration
Other tables



Power Pages
Pages
Styling
Data
Set up
...
Data
+ Table
Student
Table data
Search
+ Ne
All
Custom
✓ Virtual
Tables
Studer
Student Registration
Other tables

DIFFERENT TYPES

Virtual Table Providers

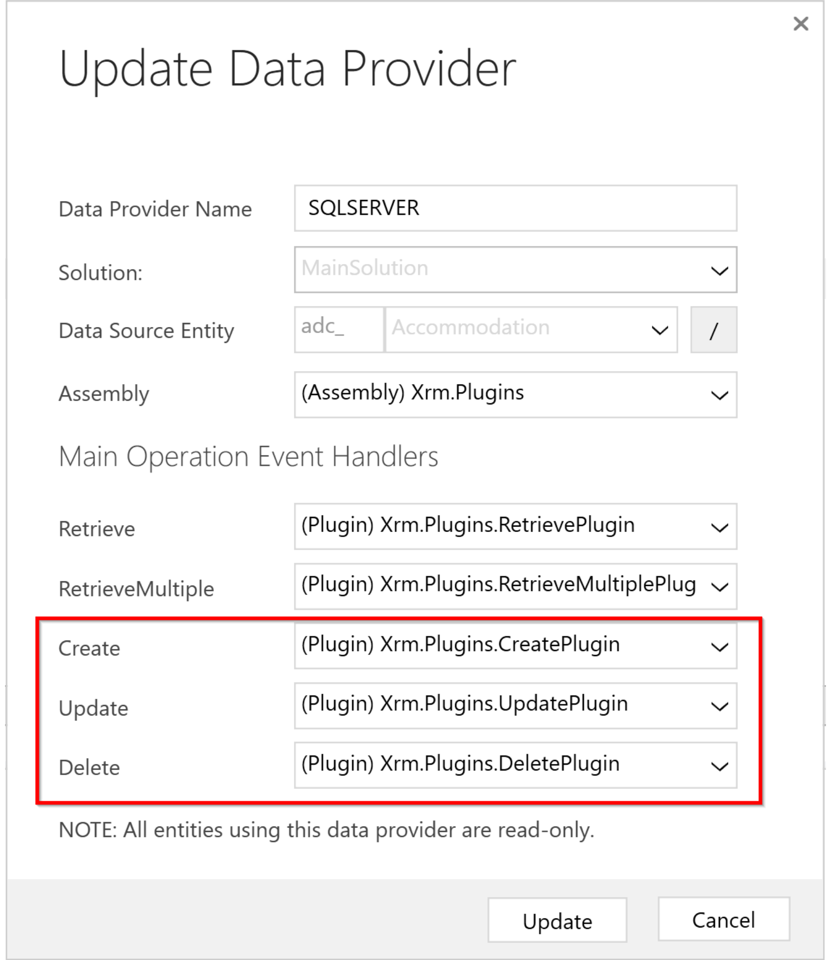
	Virtual Connector Providers	OData Data Providers	Custom Data Providers
Code required	No Code	Pro	Pro
Data sources supported	Excel, SharePoint, SQL	OData web services; such as D365 or Azure	Custom plugins to call APIs
Easy to setup/ Supportability	Easy	Medium	Difficult

FUNCTIONALITY

WHAT CAN IT DO?

- Connect to your data source that's not natively on Dataverse
- Full CRUD operations for custom virtual tables
  (if the source let's you)
- Relationships setup on native and virtual tables
- Multi-Table (Polymorphic) Lookups supporting virtual tables

Meaning, you can create lookup tables from and to your virtual table.



Update Data Provider

Data Provider Name: SQLSERVER

Solution: MainSolution

Data Source Entity: adc_ Accommodation

Assembly: (Assembly) Xrm.Plugins

Main Operation Event Handlers

Retrieve: (Plugin) Xrm.Plugins.RetrievePlugin

RetrieveMultiple: (Plugin) Xrm.Plugins.RetrieveMultiplePlug

Create: (Plugin) Xrm.Plugins.CreatePlugin

Update: (Plugin) Xrm.Plugins.UpdatePlugin

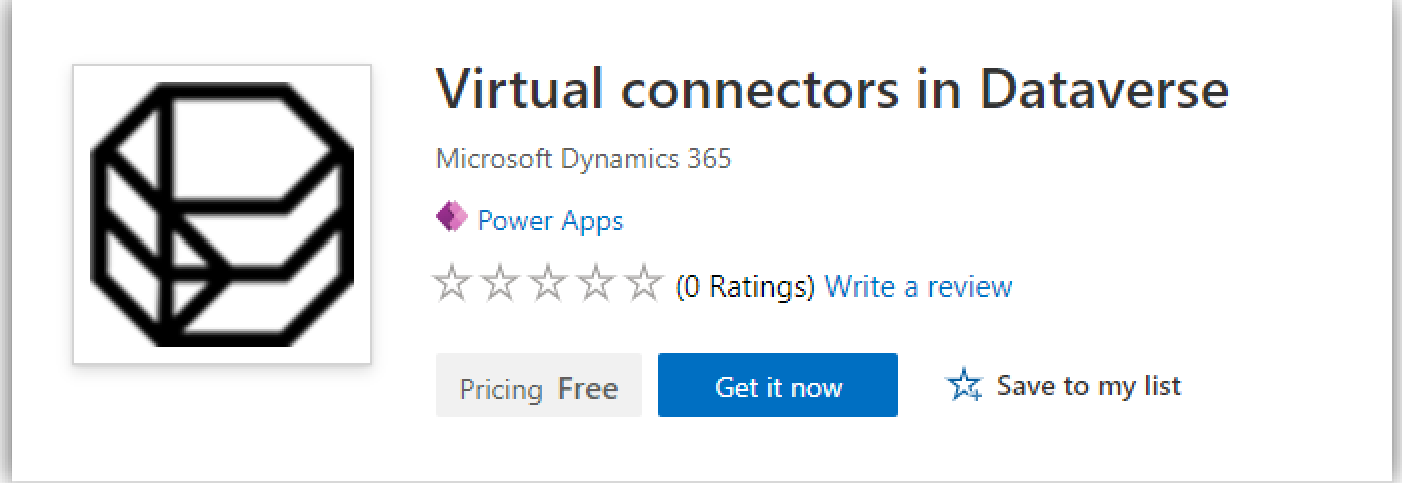
Delete: (Plugin) Xrm.Plugins.DeletePlugin

NOTE: All entities using this data provider are read-only.

More on Plug-ins later

INSTALLING VIRTUAL CONNECTORS IN DATAVERSE

1. Make sure you have Premium
   (without it, you won't be able to use Dataverse or virtual tables)
2. Go to AppSource
3. Search for Virtual Connectors in Dataverse
4. Install in your desired environment
5. You’re now ready to use virtual tables.



Virtual connectors in Dataverse

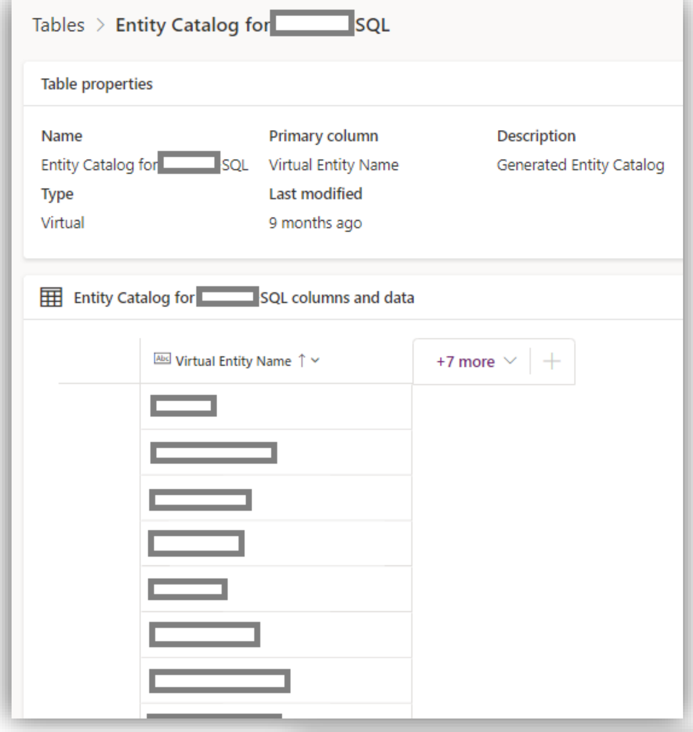
Microsoft Dynamics 365

Power Apps
☆☆☆☆☆ (0 Ratings) Write a review
Pricing Free
Get it now
Save to my list

CLASSIC WAY TO CONNECT

VIRTUAL ENTITY CATALOGUE

1. Create an entity catalog through the admin center (classic D365 experience)
2. Through that catalog, select the virtual table you want
3. Edit
4. Click on Edit Row using form
5. Wait for it to load
6. Create or Refresh Entity – Yes
7. Set the Primary key (make sure it's GUID)
8. Set the Primary Field
9. Save the form
10. It will be given the name Custom Entity and have DBO in the schema name by default.
11. The rest of the functionality is the same



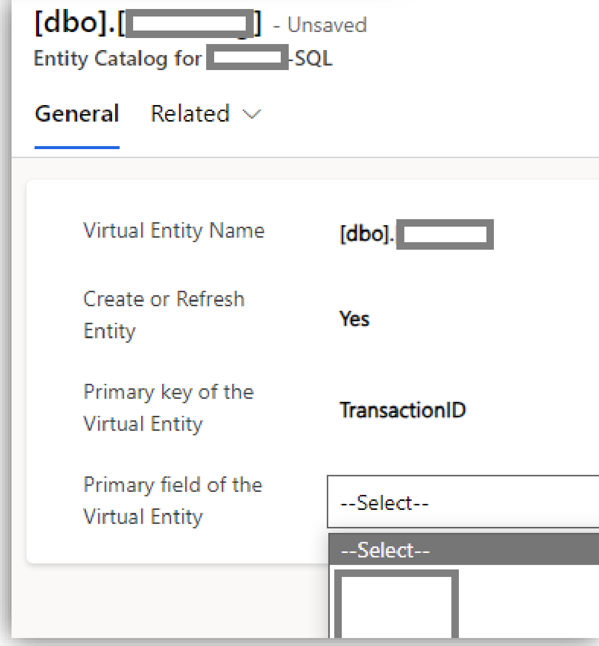
Tables > Entity Catalog for [redacted]SQL

Table properties

Name	Primary column	Description
Entity Catalog for [redacted]SQL	Virtual Entity Name	Generated Entity Catalog
Type	**Last modified**	
Virtual	9 months ago	

Entity Catalog for [redacted]SQL columns and data

Virtual Entity Name ↑	+7 more
[redacted]	
[redacted]	
[redacted]	
[redacted]	
[redacted]	
[redacted]	
[redacted]	
[redacted]	

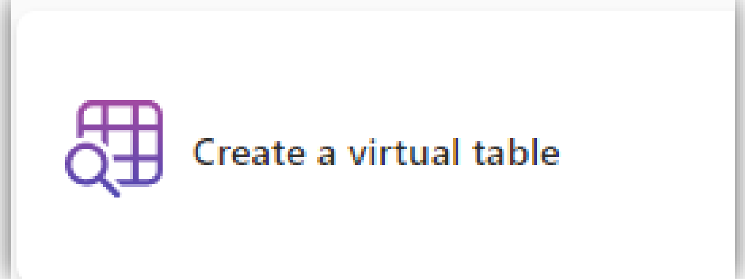


[dbo].[[redacted]] - Unsaved

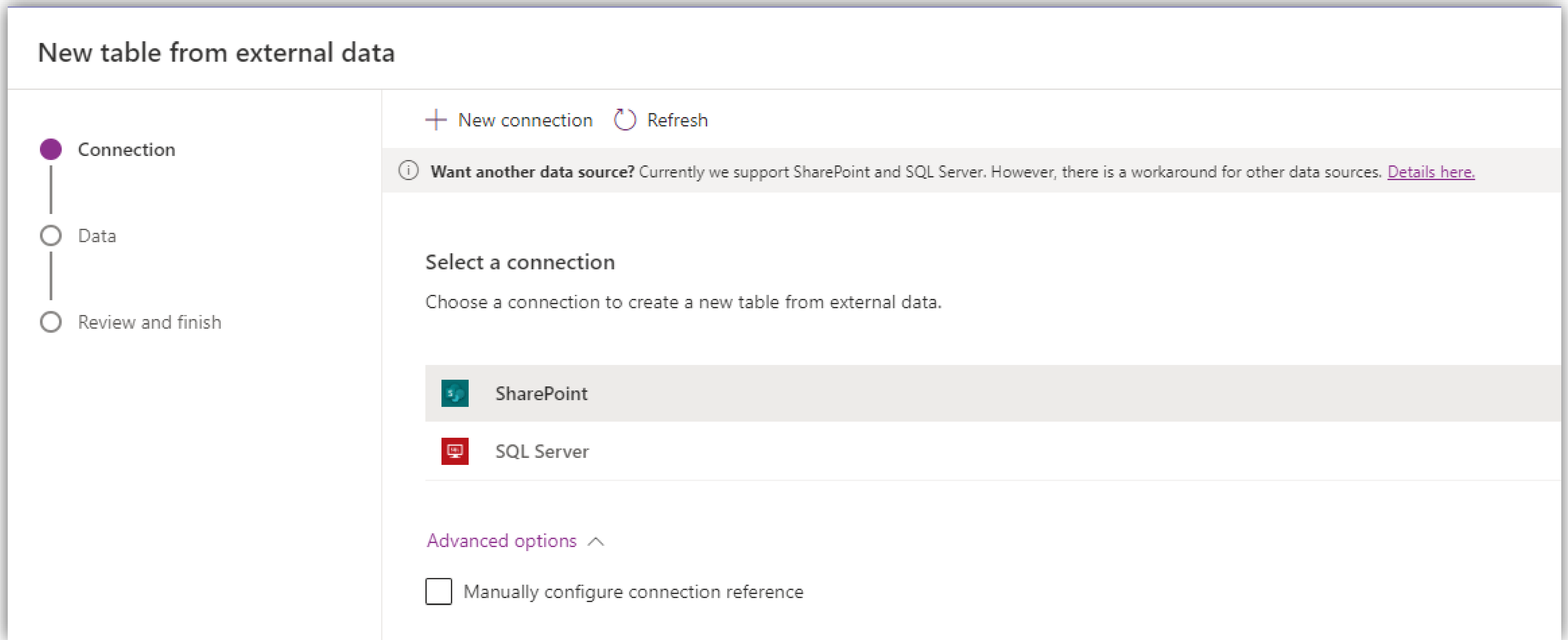
Entity Catalog for [redacted]SQL

Virtual Entity Name	[dbo].[redacted]
Create or Refresh Entity	Yes
Primary key of the Virtual Entity	TransactionID
Primary field of the Virtual Entity	--Select--

CREATE A VIRTUAL TABLE



Create a virtual table



New table from external data

● Connection
○ Data
○ Review and finish

+ New connection   Refresh

ⓘ **Want another data source?** Currently we support SharePoint and SQL Server. However, there is a workaround for other data sources. Details here.

Select a connection

Choose a connection to create a new table from external data.

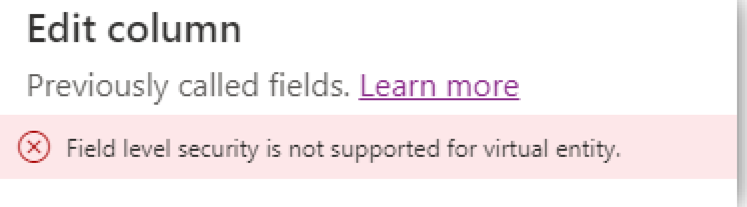
- SharePoint
- SQL Server

Advanced options

☐ Manually configure connection reference

GOVERNANCE AND COLUMN LEVEL SECURITY

Virtual tables are organizational level tables.
It will display whatever your account authorized to it has access to.



Edit column

Previously called fields. Learn more

ⓧ Field level security is not supported for virtual entity.

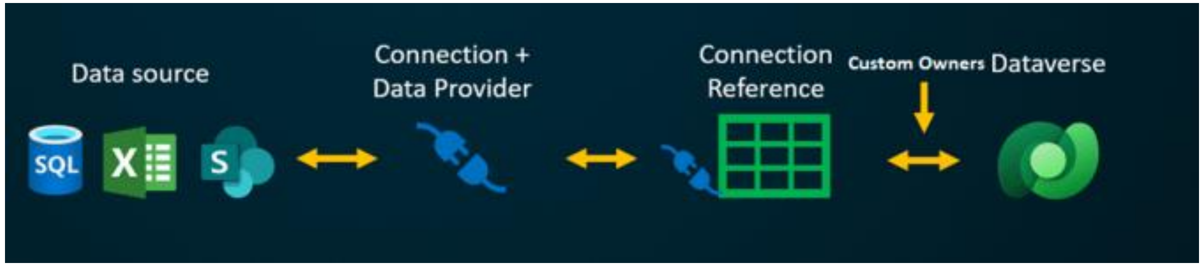
☑ Security at the source, and through security roles on Dataverse.

☒ No Field Level, or Column level security is possible/supported currently.

☑ **Custom lookup fields with polymorphic lookups**

It is possible to create custom security through polymorphic lookups and plugins.
Check out this article by Dynamics Ninja that explains how:
[Virtual Tables - Custom Ownership - Dynamics Ninja]()

Quick tip for the Security role in Dataverse;
Make sure to add rights to the Connection table.


Data source
SQL
Connection +
Data Provider
Connection
Reference
Custom Owners
Dataverse

DIFFERENT NATIVE DATA SOURCES

Excel

Let's start with the elephant in the room - Excel

WHY IS IT SUCH A BAD IDEA?

- Data **needs** to be in tables
- Macros **not** supported
- Formulas **not** supported
- Excel is currently **not** supported in the table driven Virtual Table experience
- Excel files **must be stored on a OneDrive** to participate in a Virtual Table connection
- **The workbook cannot be in use** when using it for Power Apps or Power Automate

Specific Excel Connector Limitations: Excel Online (Business) connector reference.

DIFFERENT NATIVE DATA SOURCES

SharePoint

LIMITATIONS

- You currently can't select an All view for SharePoint columns on a virtual table. This is a known issue. (It is known)
- The following column types can't be included in a virtual table at this time:

  Person
  Image
  Managed metadata
  Location: coordinates
  Attachment

- SharePoint specific columns that will be shown in the virtual table:
  - Compliance Asset ID is an internal column from SharePoint for tracking purposes. It can be ignored.
    - ID is the external primary key from SharePoint. It's read-only and can be ignored.

- Choice fields supported for SharePoint!
- Attachments can be uploaded to the virtual table connection

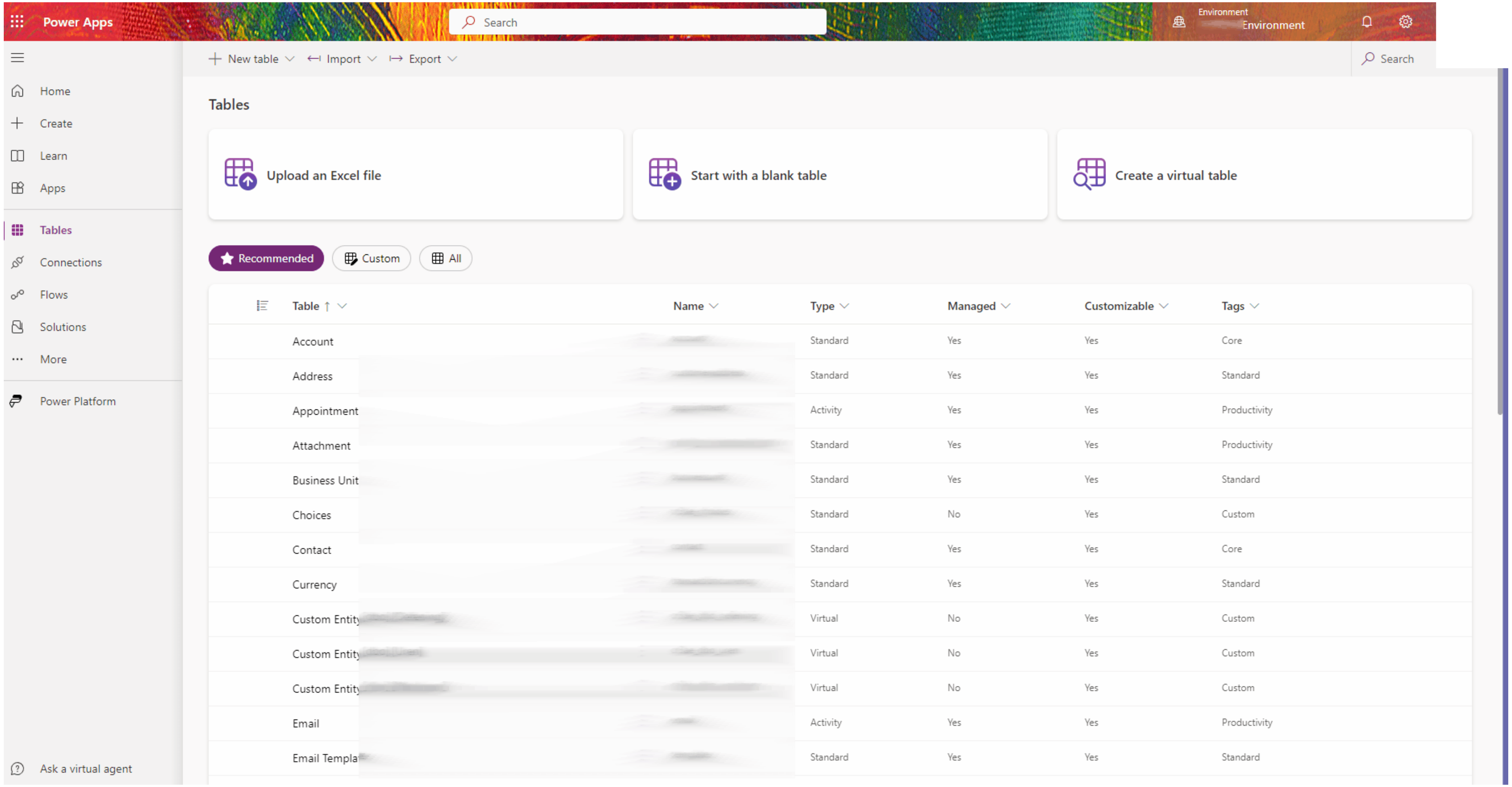
☑

DIFFERENT NATIVE DATA SOURCES

SQL

CONNECTING TO SQL

Pro tip!
toggle/checkbox/Boolean
Convert your SQL column to BIT
BIT is an integer with 0 and 1


Power Apps
Search
Environment
[redacted] Environment
New table
Import
Export
Search
Home
Create
Learn
Apps
Tables
Connections
Flows
Solutions
More
Power Platform
Ask a virtual agent
Upload an Excel file
Start with a blank table
Create a virtual table
Recommended
Custom
All

Tables

Table ↑	Name	Type	Managed	Customizable	Tags
Account	[redacted]	Standard	Yes	Yes	Core
Address	[redacted]	Standard	Yes	Yes	Standard
Appointment	[redacted]	Activity	Yes	Yes	Productivity
Attachment	[redacted]	Standard	Yes	Yes	Productivity
Business Unit	[redacted]	Standard	Yes	Yes	Standard
Choices	[redacted]	Standard	No	Yes	Custom
Contact	[redacted]	Standard	Yes	Yes	Core
Currency	[redacted]	Standard	Yes	Yes	Standard
Custom Entity[redacted]	[redacted]	Virtual	No	Yes	Custom
Custom Entity[redacted]	[redacted]	Virtual	No	Yes	Custom
Custom Entity[redacted]	[redacted]	Virtual	No	Yes	Custom
Email	[redacted]	Activity	Yes	Yes	Productivity
Email Templa[redacted]	[redacted]	Standard	Yes	Yes	Standard

[Dataverse Choices to SQL backend- Update! - Power Platform Tips & Tricks (nathalieleenders.com)](nathalieleenders.com)

VIRTUAL STORED PROCEDURE

Through the Dataverse Accelerator App

Dataverse uses the plugin capability to call stored procedures.

- You can specify how you want to fill it through the wizard.
- Input what is needed, in the plugin it will allow you to say:
  field a is input 1
  field b is input 2
- Make it execute on a button as an onclick event
- Run and push it the output only to a SQL table
- Access a Virtual Table to access the SQL Table

Low code plugins - SQL Stored Procedure Part 1

Create a stored procedure plugin

No delegation issues

That is an issue through when you try through Power Automate.
Also, it’s much faster and much more responsive.

Output stays in SQL right now but this could be valuable to your client process.

VIRTUAL TABLES WITH AAD TABLE?

AAD User (Azure Active Directory/Entra ID) is different from the **User table** in Dataverse.

No manager lookups, possible future feature
No groups, only users can be looked up

Dataverse User table	Only displays users with a Dataverse license.
AAD User table	Will show anyone in the AAD User address book.

☒ Virtual table that connects to ALL users as **read-only**.

☒ This table is NOT available through Power Automate. (It leverages Graph)

☑ Include the AAD User table in multi-table lookups (polymorphic lookups)

[aaduser table/entity reference (Microsoft Dataverse) - Power Apps | Microsoft Learn]

LEVERAGING THE POWER PLATFORM

Model Driven Apps

☑ Works with Dataverse

☒ Any other data source needs to be connected through a virtual table.

Power Pages

☑ Works with Dataverse

☒ Any other data source needs to be connected through a virtual table.

Canvas Apps

- ☑ Works with all data connectors!
- ☒ Save data locally in the table.
- ☒ Patch to the virtual table with custom fields.
- ☑ Display data through lookup fields

Power Automate

☒ Dataverse trigger - ‘ When a row is added, modified or deleted’ doesn’t work with Virtual Tables.

☑ Use a trigger on your data source!

For example, when a SQL item has been modified.

☑ Dataverse trigger - ‘ When a row is added, modified or deleted’ is supported for Virtual Tables with Dataverse Events (More on that later)

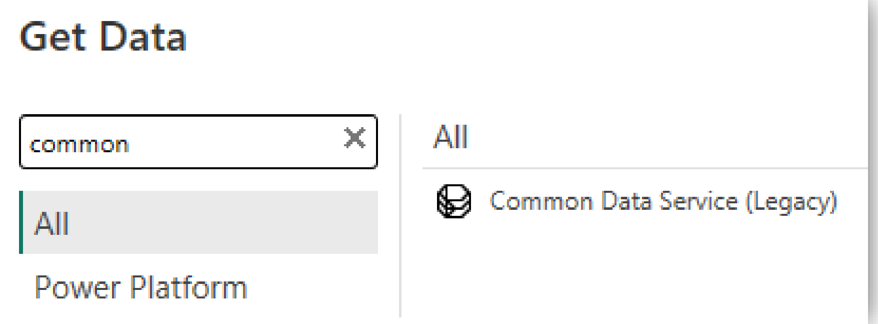
Power Virtual Agent

- ☑ You can call information from Dataverse, both normal and virtual tables.
- ☑ Connect using Power Automate in an action to create new rows, update rows, list rows etc. for a Virtual Table.

REPORTING

Virtual Table - Reporting

- ☑ Only available in PowerBI through the Common Data Service (Legacy) connector
- ☒ Don’t use the Dataverse connector.
  It wont display the virtual tables.
- ☑ You can also connect directly to the source as well.
- [Power Query Common Data Service (Legacy) connector]()



Get Data

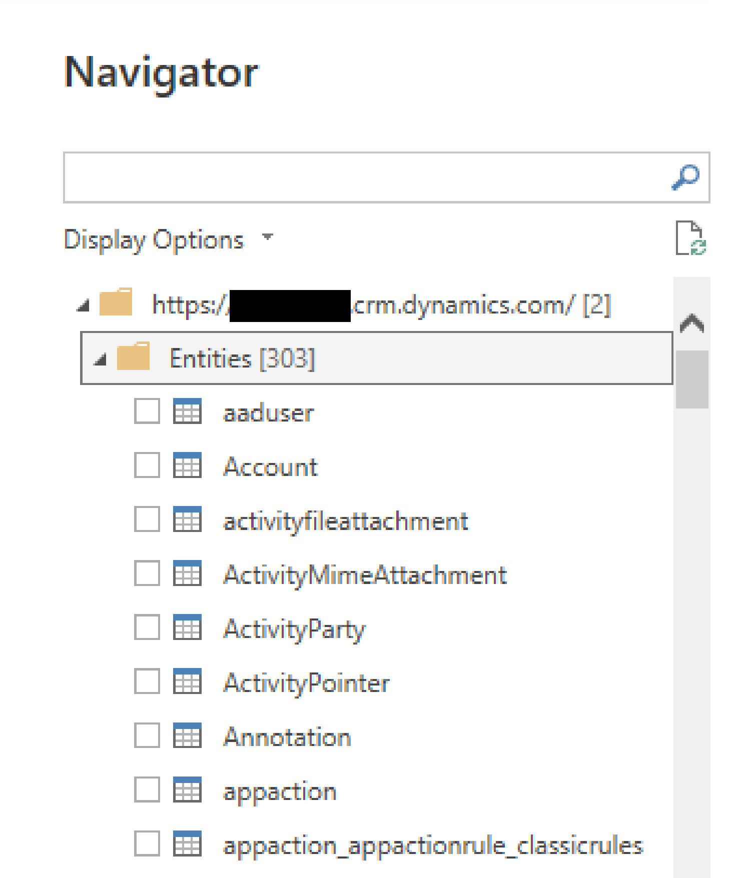
common ✕

All

Power Platform

All

Common Data Service (Legacy)



Navigator

Display Options

https:/[redacted].crm.dynamics.com/ [2]

Entities [303]

☐ aaduser
☐ Account
☐ activityfileattachment
☐ ActivityMimeAttachment
☐ ActivityParty
☐ ActivityPointer
☐ Annotation
☐ appaction
☐ appaction_appactionrule_classicrules

KNOWN LIMITATIONS ON ALL VIRTUAL TABLES + POSSIBLE WORKAROUNDS

Positive points

POSITIVITY BEAM
HUZZAH
imgflip.com

- View data from multiple tables as a single table
- Perform complex queries
- View of data that is customized for a specific user or group
- Access data from external sources
- No need to migrate data
- Cost saving – no double data storage needed like with Dataflows
- Easy setup, no custom coding needed
- You're able to leverage them throughout the entire Power Platform
- Supported by Dataverse for Teams

My Microsoft Idea that needs votes! Getting Choices supported on SQL

Limitations

1. No dropdown/choice columns on SQL data backend
2. No Field Level Security possible (Security at the source)
3. Business Process Flows are not supported
4. Files and attachments are not supported
5. Virtual table queries are limited to return 1000 records per query
6. Max character length for text is 4000 characters
7. No activity type tables (feedback)

- Rollup and calculation fields not supported
- Audit logs - No Dataverse auditing possible on a virtual table
- Values inside Primary Column need to be GUID (non string)
- The primary key needs to be correct or the data (SQL or Excel) wont display
- Cannot set view on primary key column – descending
- Dataverse can only create columns that include datatypes that are compatible
- Existing tables cannot be converted
- Virtual tables don’t allow joined connections
- SharePoint will use the hidden numeric ID field present in all lists

WELL
THAT ESCALATED QUICKLY
quickmeme.com

PCF COMPONENTS

Trick your virtual entity connection into allowing dropdowns, or other unsupported ISV/data actions.

For example: A dropdown/choice doesn’t exist into SQL.
Make it look like one, but have the data be outputted as text.

What is a PCF component?

It’s a piece of code, wrapped around your control, to make it behave differently, but still have the same result for your data source.

You can re-use these components throughout your solution.

- After importing your component
- Double click on your control in your form
- Add to your form control (if desired, hide the default controls)

[CSV Dropdown Control | PCF Gallery]()

Pro tip – Make sure you also import your PCF component in your destination environment if you do ALM

SHORT INTERMISSION

Taking a breather

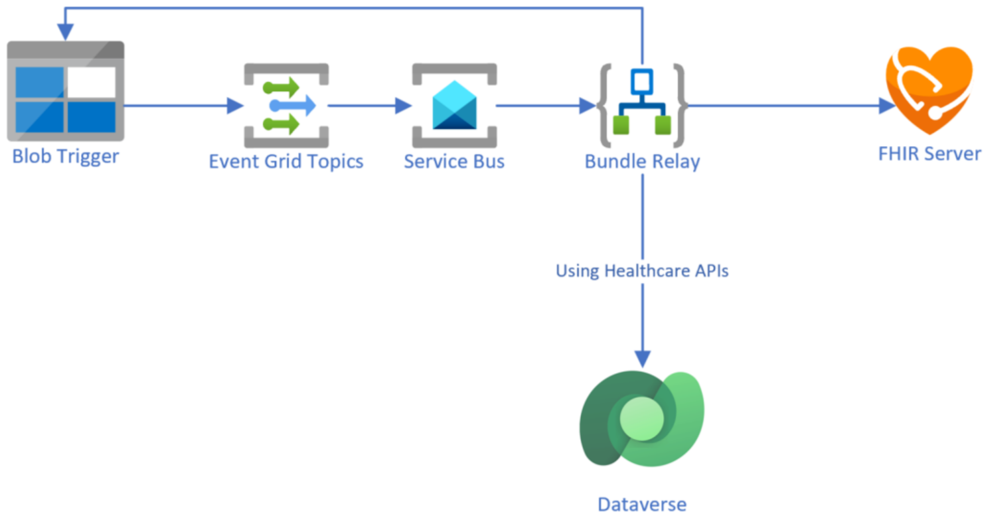
TECHNICAL DEEP DIVE

DATAVERSE EVENTS

Respond to Dataverse Events with Virtual Tables

What is a Dataverse Event?

- Power Automate Flows
- Azure Service Bus
- Azure Event Hub
- Webhooks
- Dataverse plug-ins


Blob Trigger
Event Grid Topics
Service Bus
Bundle Relay
FHIR Server
Using Healthcare APIs
Dataverse

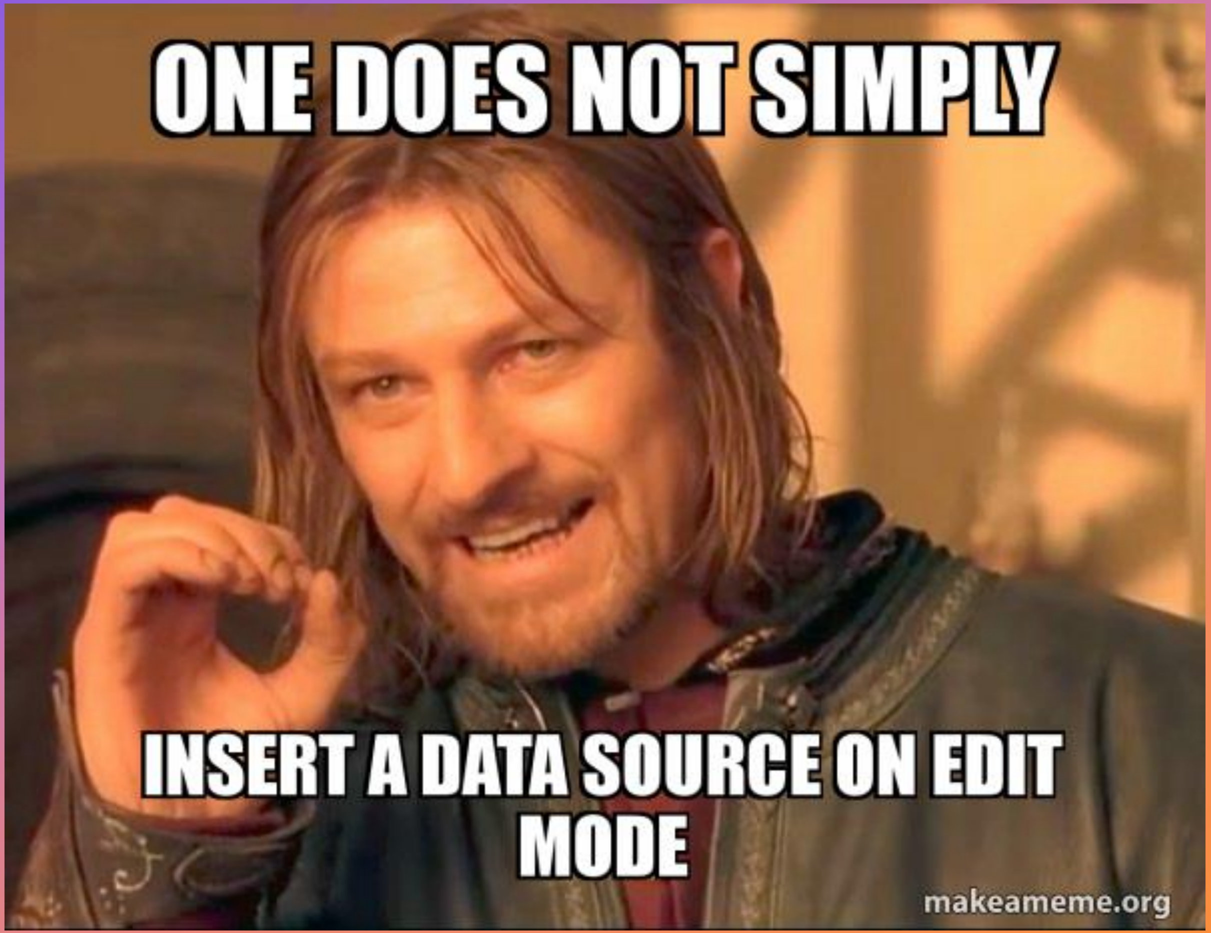
Participate in asynchronous Dataverse Event Framework pipeline events.

Most importantly, you can leverage the Dataverse ‘when a row is added modified or deleted’ trigger.

[Enable Virtual Tables to support Dataverse events (Microsoft Dataverse) - Power Apps | Microsoft Learn]

DIFFERENT DATA SOURCES

All 1000+ Data connectors?


ONE DOES NOT SIMPLY
INSERT A DATA SOURCE ON EDIT MODE
makeameme.org

Virtual Table Providers

	Virtual Connector Providers	OData Data Providers	Custom Data Providers
Code required	No Code	Pro	Pro
Data sources supported	Excel, SharePoint, SQL	OData web services; such as D365 or Azure	Custom plugins to call APIs
Easy to setup/ Supportability	Easy	Medium	Difficult

OData Data Providers

MANY CONNECTORS SUPPORT API ACTIONS (FOR CRUD)

IT MUST HAVE A GUID VALUE THAT DATAVERSE CAN USE AS A PRIMARY KEY TO WORK

YOU **CAN'T** USE IT TO CONNECT TO ANOTHER ENVIRONMENT

USE THE VIRTUAL TABLE ODATA V4 DATA PROVIDER WITH MICROSOFT DATAVERSE - POWER APPS | MICROSOFT LEARN

CONNECT TO MANY OTHER DATA SOURCES

Remember those 1000+ connectors?

Leverage the Microsoft Dataverse Data SDK to query against your Virtual Table, using code to get data.

Create custom virtual data providers. ODatav4 interface supports CRUD

Requirements:

- C# code
- API knowledge
- Visual Studio Code
- Microsoft.CrmSdk.Data package
- Install NuGet packages
- Relevant API accounts, access tokens and such

WHEN THIRD PARTY API
SENDS XML INSTEAD OF JSON
imgflip.com

You can leverage this in ISV’s, third party apps and more.

Be mindful of the limitations, and whether your backend can handle such queries/code.

https://learn.microsoft.com/en-us/power-apps/developer/data-platform/virtual-entities/sample-ve-provider-crud-operations/

CUSTOM VIRTUAL DATA PROVIDER

With CRUD

Virtual Table Providers

	Virtual Connector Providers	OData Data Providers	Custom Data Providers
Code required	No Code	Pro	Pro
Data sources supported	Excel, SharePoint, SQL	OData web services; such as D365 or Azure	Custom plugins to call APIs
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Virtual Tables – CRUD Plugin 1/3

Implementing CRUD plug-ins and registering the assembly

1. Create a plugin project, and install the NuGet packages
2. Add the 6 class files to your solution, in each use specific statements
3. Create the code for all these 6 classes
4. Compile and build the solution
5. Register the assembly using the plugin registration tool (NuGet)
6. Create a new connection to your data verse environment
7. Select the assembly file and register the plugin
8. Make sure to select all plugins for Create, Update, Delete etc.

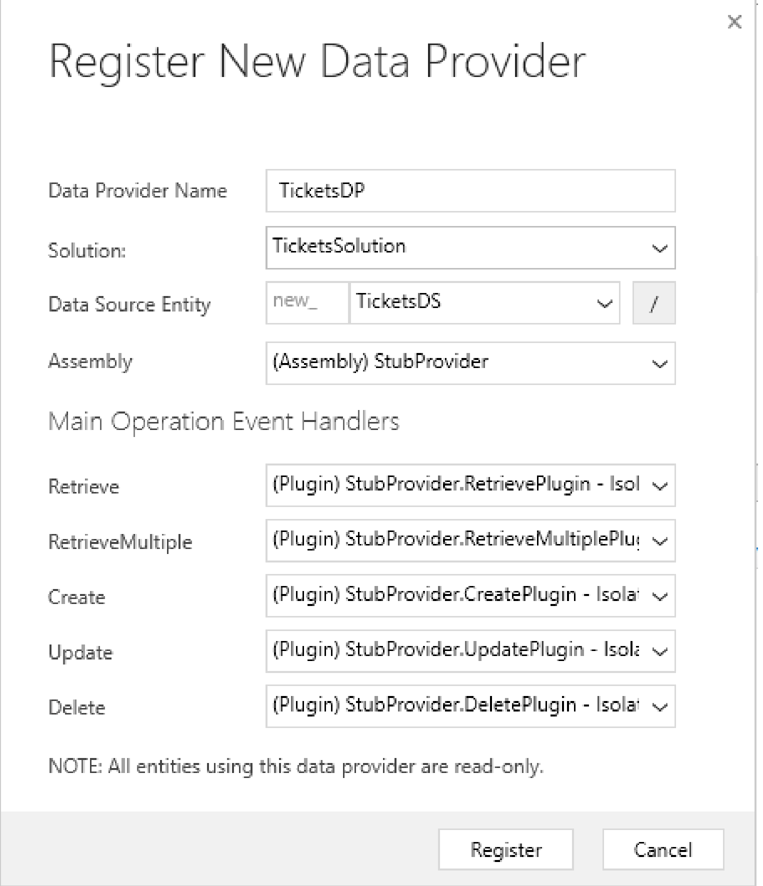
Class file name	Purpose
Connection.cs	This class contains code for creating and managing connection to the external SQL data source. It includes connection string parameters specific to the external database and SQL-based authentication information required to establish the connection. Replace the values respective to your: Database server, UserID, Password, and table name that you will be creating a virtual table in Dataverse.
CreatePlugin.cs	This class contains code that handles the create operation for the virtual table.
UpdatePlugin.cs	This class contains code that handles updating records in the virtual table.
RetrievePlugin.cs	This class contains code that retrieves a specific record from the virtual table.
RetrieveMultiplePlugin.cs	This class contains code for fetching multiple records from the virtual table.
DeletePlugin.cs	This class contains code that allows you to delete a record in the virtual table.

Virtual Tables – CRUD Plugin 2/3

Creating data provider and adding plug-ins to the provider

9. Select the Register drop-down and then select Register New Data Provider.
10. In the Register New Data Provider dialog, enter the following details:
11. Enter Data Provider Name.
12. In the Solutions option, select an existing solution or create a new solution in the drop-down.
13. In the Data Source Table (Entity) option, select Create New Data Source.

    Enter the details. Make sure that the data source is part of the solution you created or selected.
14. Map each of the registered plug-in to its respective operations.
15. Register the new data provider.
16. In the Plugin Registration Tool, you'll see the new data source record and the associated data provider. Selecting the data source will display the details which include the plug-ins and their registered GUID.



Register New Data Provider

Data Provider Name: TicketsDP
Solution: TicketsSolution
Data Source Entity: new_ TicketsDS
Assembly: (Assembly) StubProvider

Main Operation Event Handlers

Retrieve: (Plugin) StubProvider.RetrievePlugin - Isol
RetrieveMultiple: (Plugin) StubProvider.RetrieveMultiplePlu
Create: (Plugin) StubProvider.CreatePlugin - Isola
Update: (Plugin) StubProvider.UpdatePlugin - Isol
Delete: (Plugin) StubProvider.DeletePlugin - Isola

NOTE: All entities using this data provider are read-only.

Virtual Tables – CRUD Plugin 3/3

17. Create a new virtual table data source by navigating to Setting > Administration > Virtual Table (Entity) Data Sources.
18. Select New and then select the data provider you created in the previous step from the drop-down.
19. Enter a name for the data source and select Save and Close.
20. You are now ready to create the virtual table that represents the external data source. To do this, go to Settings > Customize the System.
21. In the left navigation pane of solution explorer, Select Tables (Entities), and then select New.
22. Enter the following details on the right side
23. Save and Close
24. In the left navigation pane, select and expand on the virtual table you created.
25. Select Fields to update and create new columns representing the external source.
26. Select the Primary Key column for the virtual table and select Edit.
27. Update the External Name column to match the column name in your external data source. In this example, the external column name is TicketID.

API

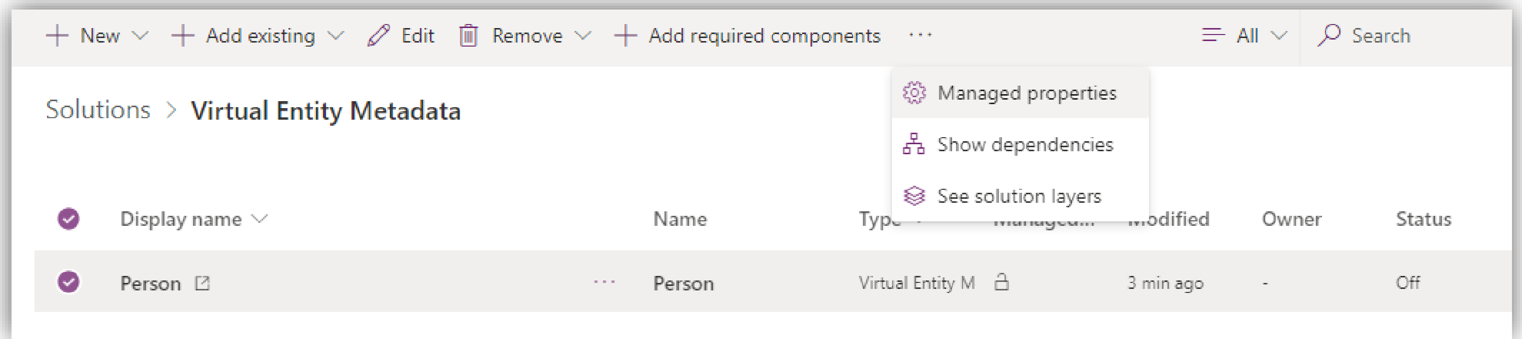
(Application Programming Interface)

Virtual Tables – API-1/4

Leverage a REST API, and use GET, PUT, POST, DELETE and other standard HTTP verbs.

1. Set up Virtual Table Metadata – specify your Extension Entity ID
2. Once set up – go to the following URL:
   [Organization Uri]/api/data/v9.2/$metadata

3. Search for ‘OnExternalCreated’ and find the definition of your action.


+ New
+ Add existing
Edit
Remove
+ Add required components
...
All
Search
Managed properties
Show dependencies
See solution layers

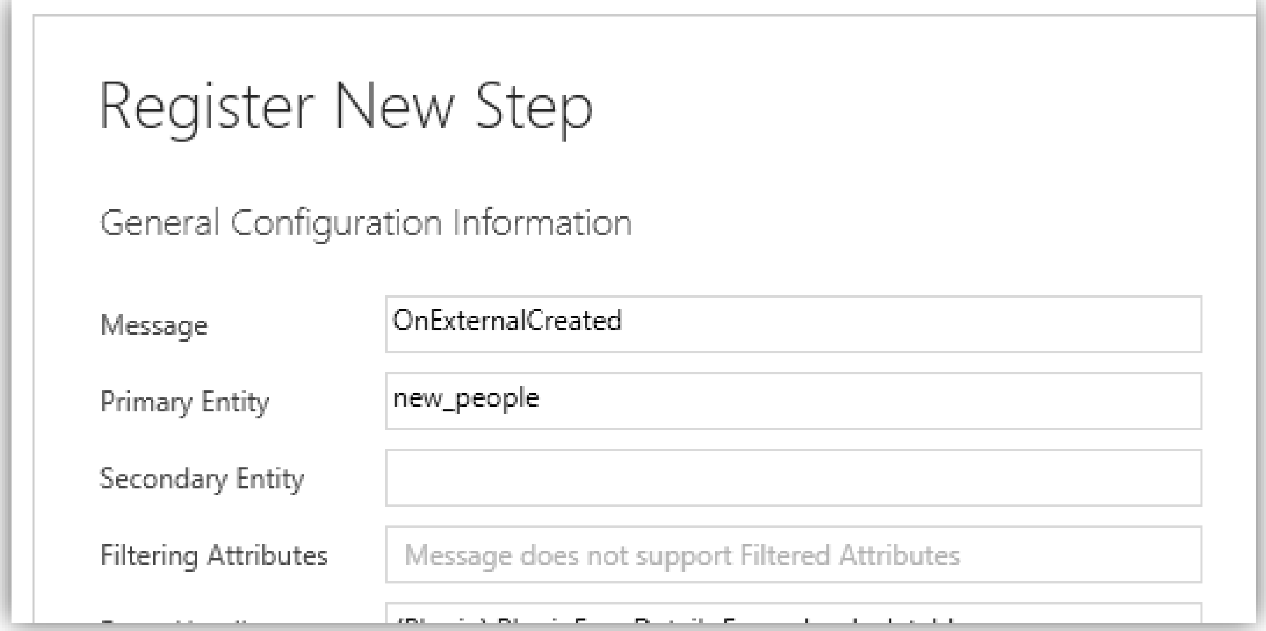
Solutions > Virtual Entity Metadata

Display name	Name	Typ	Managed...	Modified	Owner	Status
Person	Person	Virtual Entity M		3 min ago	-	Off

Virtual Tables – API-2/4

Register a plug in

4. Open the Plugin registration tool.
5. Go to your plugins
6. Register a new step



Register New Step

General Configuration Information

Message	OnExternalCreated
Primary Entity	new_people
Secondary Entity	
Filtering Attributes	Message does not support Filtered Attributes

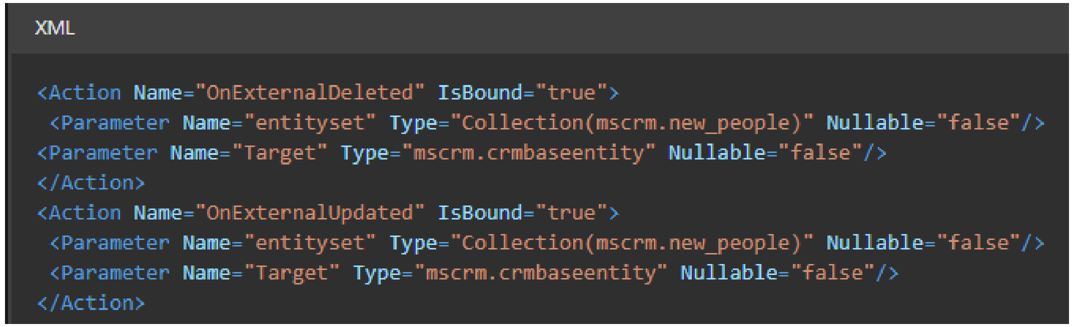
Virtual Tables – API-3/4

Create a bound action

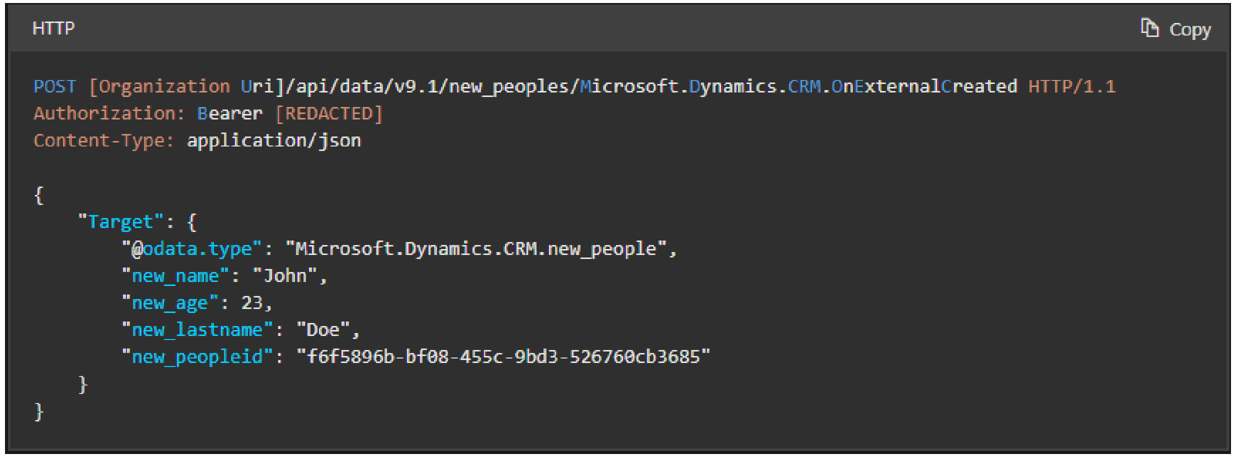
This example is the OnExternalCreated.

7. Include the ID value, and other known properties.
8. Make sure the target parameter is always set to the @odata.type annotation property to define the type of entity.

   Without this it wont work.
9. The calls should always return: 204: No Content



```xml
<Action Name="OnExternalDeleted" IsBound="true">
 <Parameter Name="entityset" Type="Collection(mscrm.new_people)" Nullable="false"/>
<Parameter Name="Target" Type="mscrm.crmbaseentity" Nullable="false"/>
</Action>
<Action Name="OnExternalUpdated" IsBound="true">
 <Parameter Name="entityset" Type="Collection(mscrm.new_people)" Nullable="false"/>
 <Parameter Name="Target" Type="mscrm.crmbaseentity" Nullable="false"/>
</Action>
```



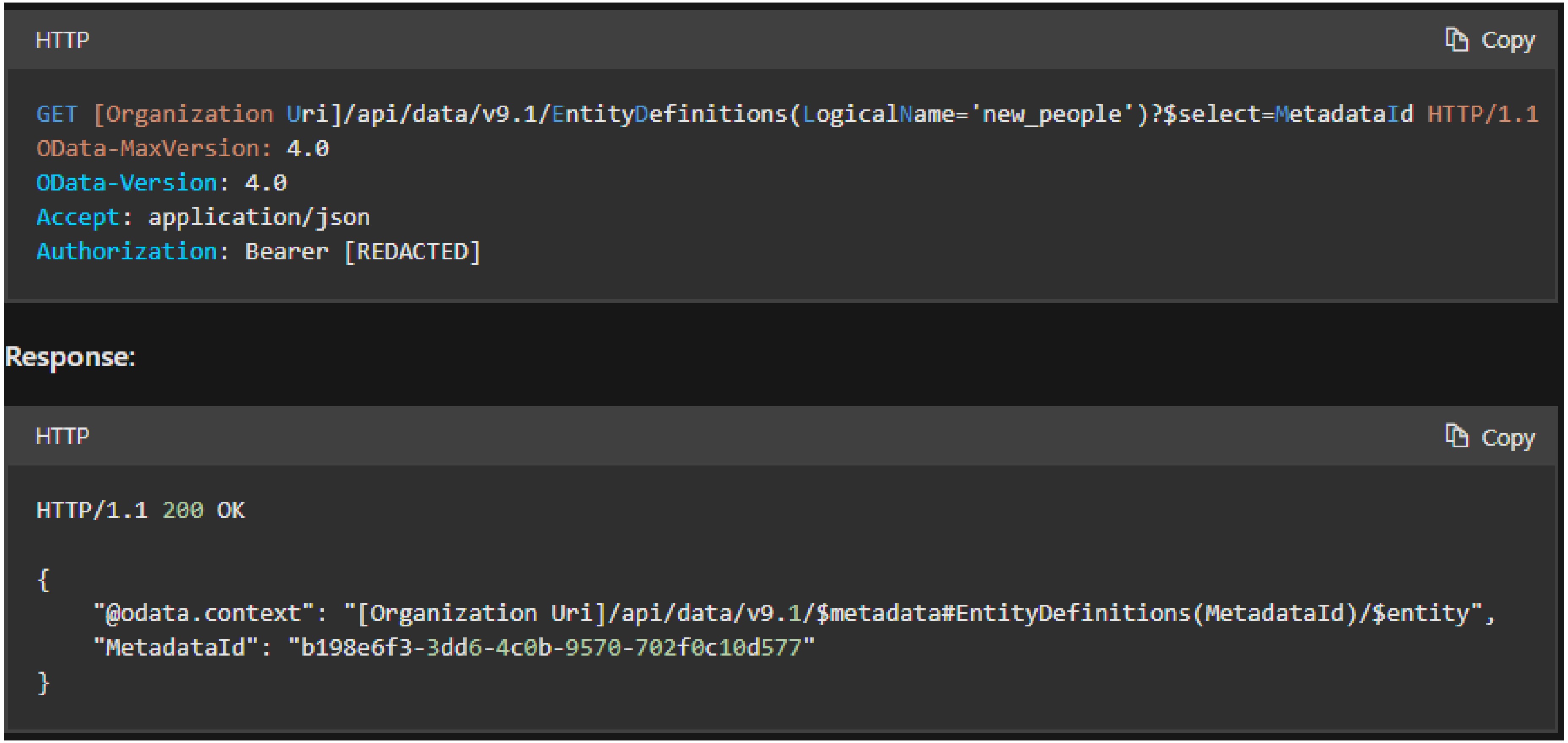
```http
POST [Organization Uri]/api/data/v9.1/new_peoples/Microsoft.Dynamics.CRM.OnExternalCreated HTTP/1.1
Authorization: Bearer [REDACTED]
Content-Type: application/json

{
    "Target": {
        "@odata.type": "Microsoft.Dynamics.CRM.new_people",
        "new_name": "John",
        "new_age": 23,
        "new_lastname": "Doe",
        "new_peopleid": "f6f5896b-bf08-455c-9bd3-526760cb3685"
    }
}
```

Virtual Tables – API-4/4

Results

10. When using the WEB API, get the MetadataID of the Virtual Table



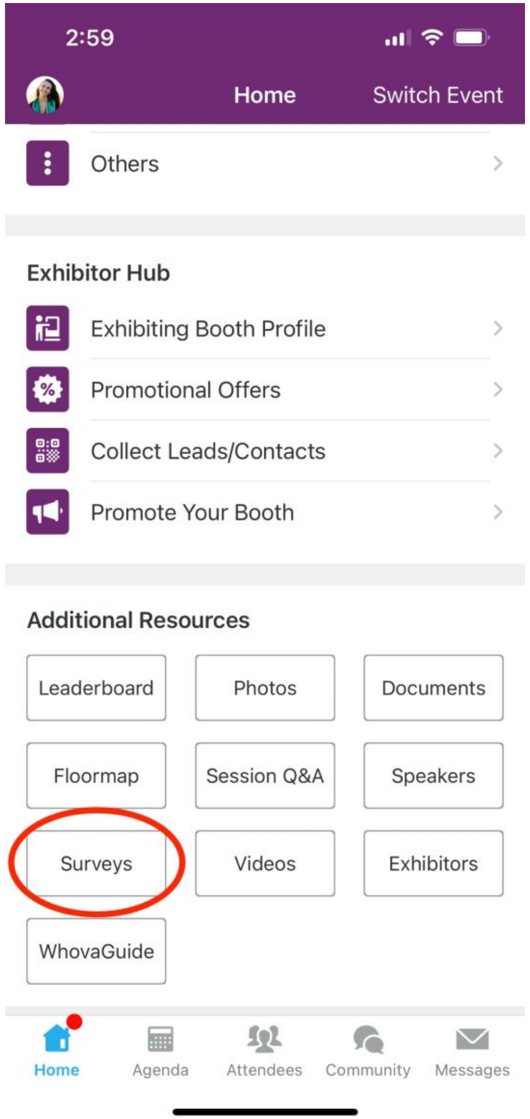
```
GET [Organization Uri]/api/data/v9.1/EntityDefinitions(LogicalName='new_people')?$select=MetadataId HTTP/1.1
OData-MaxVersion: 4.0
OData-Version: 4.0
Accept: application/json
Authorization: Bearer [REDACTED]
```

Response:

```
HTTP/1.1 200 OK

{
    "@odata.context": "[Organization Uri]/api/data/v9.1/$metadata#EntityDefinitions(MetadataId)/$entity",
    "MetadataId": "b198e6f3-3dd6-4c0b-9570-702f0c10d577"
}
```

Session Feedback Surveys


2:59
Home
Switch Event
Others
Exhibitor Hub
Exhibiting Booth Profile
Promotional Offers
Collect Leads/Contacts
Promote Your Booth
Additional Resources
Leaderboard
Photos
Documents
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THAT'S IT- QUESTIONS?

FRANTIC MEEPING

THANK YOU

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